UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,230	12/19/2001	Robert P. Carlstedt	60,130-1027/01MRA0149	7385

26096 7590 06/13/2003

CARLSON, GASKEY & OLDS, P.C.
400 WEST MAPLE ROAD
SUITE 350
BIRMINGHAM, MI 48009

EXAMINER
SPISICH, GEORGE D

ART UNIT	PAPER NUMBER
3616	

DATE MAILED: 06/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

HN

Office Action Summary	Application No.	Applicant(s)	
	10/025,230	CARLSTEDT ET AL.	
	Examiner	Art Unit	
	George D. Spisich	3616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

On at least page 3, lines 2, 3 and 4 of paragraph 12, the numbering of the control arms is inconsistent with the figures.

On line 2 of paragraph 12, "upper 18" should be - - upper 14 - -.

On line 3 of paragraph 12, "upper 16 and lower 18" should be - - upper 14 and lower 16 - -.

On line 4 of paragraph 12, "arms 16 and 18" should be - - arms 14 and 16 - -.

Appropriate correction is required.

Drawings

The drawings are objected to because Figures 2 and 3 do not seem to be an appropriate representation of and consistent with Figures 1 and 4. Elements 14 and 16 in Figures 1 and 4 appear to be part of the actuator in Figure 1 and 4 and do not appear similarly in Figures 2 and 3. It is unclear how the actuator would work with elements as shown in Figure 2 and 3. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> **(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.**

Claims 1, 3, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (USPN 5,700,025).

Lee discloses a suspension assembly for a vehicle inherently having a frame, and first and second control arms (3 and 4) in spaced relation to one another, and the control arms having first and second opposing portions with the first portions pivotally connected (via a linkage) to the frame, and a knuckle (2) supported by the second portion of the first control arm at a first connection and the second portion of the second control arm at a second connection, and the connections defining camber, caster, toe and track. Lee shows first and second actuators (44) in connection (via a linkage) with the first control arm and moving the first connection relative to the frame and a third actuator (34) in connection (via a linkage) with the second control arm and moving the second connection relative to the frame. Lee discloses a sensor (90, 91, 92) for sensing vehicle ride conditions and a controller (9) connected to the sensor and the

actuators commanding the actuators to adjust at least one of the caster, camber, toe and track in response to the vehicle ride conditions.

Lee shows the first control arm (as defined by having first and second actuators) is a lower control arm and the second control arm is an upper control arm.

The first and second actuators are generally coplanar and the actuators are generally parallel with the control arms.

Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Goetzen et al. (USPN 6,293,561).

Goetzen et al. (see figures 4 and 5) disclose a suspension assembly for a vehicle comprising a frame and first and second control arms (3, 4 and 22). Since elements 3 and 4 also support the upper part of the wheel carrier/knuckle 20, the are considered to be control arms. The control arms have first portions that are pivotally connected to the frame. There is a knuckle (20) supported by the second portion of the first control arm at a first connection and the second portion of the second control arm at a second connection, the connection defining camber, caster, toe and track and first and second actuators (3 and 4) in "connection" with the first control arm (shown as an upper control arm) and moving the first connection relative to the frame. Goetzen et al. shows a third actuator (5) in connection with the second control arm (22) and moving the second connection relative to the frame. There is a sensor and controller (9) (shown in fig. 1) that detects vehicle conditions and commands actuators to adjust at least one of the caster, camber, toe, and track in response to the vehicle ride conditions.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

Claims 1-3, 8, 9, 11, 12 and 16-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss (USPN 6,267,387) in view of Goetzen et al. (USPN 6,293,561).

Weiss discloses a suspension assembly for a vehicle comprising a frame (11) and first (13) and second (5) control arms in spaced relation to one another and the control arms having first and second opposing portions with the first portions pivotally connected to the frame, and a knuckle (3) supported by the second portions of the first control arm at a first connection and the second portion of the second control arm at a second connection and the connections defining camber, caster, toe and track, as any suspension would. Weiss discloses a first actuator (15) in connection with and supported by the first control arm (13) and moving the first connection relative to the frame. Weiss also discloses an actuator (22) in connection with and supported by the second control arm and moving the second connection relative to the frame. Weiss's arrangement is an active wheel geometry adjustment device which responds to a vehicle ride condition (a sensor) and has a controller (at least 33) connected to the

sensor and the actuators to adjust at least one of the caster, camber, toe and track in response to the vehicle ride conditions.

However, Weiss does not show the use of a second actuator on one of the control arms.

Goetzen et al. in a variety of figures (see figures 1-5), shows the use of 2 actuators relative to one control arm. This use of a plurality of actuators would give a wider and increased adjustability to the geometry of the wheel.

In would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the adjustable suspension arrangement of Weiss by providing a second actuator relative to the upper control arm or the lower control arm as taught by Goetzen et al. (in at least Fig. 5) to optimize the adjustability of the wheel arrangement. In this modified arrangement, two of the actuators (the first and now second) would be coplanar and also parallel with the control arms and therefore meet the limitations of claims 8 and 9.

Claims 4-7 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss in view of Goetzen et al. as applied to claims 1-3, 8, 9, 11, 12 and 16-19 above, and further in view of Mackle et al. (USPN 6,347,802)

Weiss and Goetzen et al. have been discussed in a prior rejection. However, neither reference specifically discloses the vehicle ride condition which is sensed that ultimately effects the adjustment of the wheel geometry.

Examiner takes Official Notice that steerable wheel vehicle suspensions would include a steering linkage which is mechanically connected to the steering wheel connected to the steering linkage for rotating the knuckle about and axis defined by the connections by manipulating the steering linkage. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a steering wheel arrangement with the suspension arrangement.

Mackle et al. teaches an vehicle suspension having an adjustable geometry that is interrelated with the steering wheel position and the vehicle yaw rate (see col. 2. lines 46-49) and the anti-lock braking system (see col. 3, lines 11-12 and lines 25-29) which adjusts the attitude of the wheel based on these conditions. Since these conditions are monitored, the steering wheel position, the yaw, and the brake signal is therefore sensed and output is used to control the vehicle wheel geometry.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor and sense the steering wheel position, the vehicle yaw rate, and the vehicle anti-lock brake system and interrelate this vehicle ride condition with the adjustment of the camber, caster, toe or track as taught by Mackle et al. to achieve enhanced dynamic vehicle suspension performance.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weiss in view of Goetzen et al. as applied to claims 1-3, 8, 9, 11, 12 and 16-19 above, and further in view of Giltinan (USPN 5,348,334).

Weiss and Goetzen et al. have been discussed in a prior rejection. However neither specifically discloses the use of a ball joint as the connection between the actuator and the knuckle.

Gultinan teaches the use of a ball joint connection between a control arm and a knuckle.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a ball joint as the connection as taught by Gultinan in order to provide a connection with a greater degree of motion to allow for increased adjustability.

Claims 12, 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (USPN 5,700,025).

Lee has been discussed in a previous rejection. Lee further discloses that the arrangement adjusts the attitude to of the wheels with the actuators to a desired position based on vehicle riding conditions. These adjustments are camber, caster, toe and track. However, Lee does not specifically disclose providing a mechanical input from a steering wheel to spaced apart wheels.

Examiner takes Official Notice that providing a mechanical input from a steering wheel to spaced apart wheels is a conventional arrangement in a vehicle steering/suspension. Accordingly, it would obviously be in a vehicle that would incorporate the "vehicle suspension for a steerable wheel" (as titled) having wheel attitude adjustments of Lee.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Young (USPN 4,700,972), Laurent et al. (USPN 6,170,838), Zetterstrom (USPN 6,386,553), Choudhery (USPN 6,279,920), WO 91/14609.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George D. Spisich whose telephone number is (703) 305-6495. The examiner can normally be reached on Monday to Friday 6:00-3:30 except alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dickson can be reached on (703) 308-2089. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-2571 for regular communications and (703) 305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-1113.

gds
June 11, 2003

PAUL N. DICKSON 6/12/03
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600